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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/930,449	10/07/1997	HIROYUKI ABE	JAO-39514	3024
25944	7590	08/03/2004	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			RAO, SHRINIVAS H	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 08/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

08/930,449

Applicant(s)

ABE ET AL.

Examiner

Steven H. Rao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,4-18 and 64-69 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1,2,4-18 and 64-69 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 1997 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>6/30/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Priority***

Receipt is acknowledged of paper submitted under 37 CFR 1.114 claiming priority from U.S. Serial No. 08/930, 449 filed on October 07, 1997 which itself claims priority under 35 U.S.C. 119(a)-(d), from Japanese Patent Application Nos. 8-13539 filed on January 30, 1996 and 8-49021 filed June 03, 1996 which papers have been placed of record in the file.

### ***Request for Continued Examination Application (RCE)***

The request filed on 06/30/2004 for a Request for Continued Examination Application (RCE) under 37 CFR 1.114 based on parent Application No. 08/930,449 has been forwarded to the Examiner on July 09, 2004 is acceptable and a RCE has been established. An action on the RCE follows.

### ***Information Disclosure Statement***

Acknowledgment is made of receipt of Applicant's Information Disclosure Statement (PTO-1449) filed on June 30, 2004 .

In view of Applicants' failure to attach an English Language translation of the Foreign Examination report ( appears to be in Japanese ), a determination of what

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sections of the cited references were considered relevant by the Foreign Examining Authority and how the references were applied cannot be made.

The references on PTO 1499 submitted on 6/30/2004 are acknowledged. All the cited references have been considered. However the foreign patents and documents (all the 11 references listed) cited by applicant are considered to the extent that could be understood from the abstract, drawings, and translations provided

### ***Preliminary Amendment Status***

Acknowledgment is made of entry of preliminary amendment filed 6/30/2004 which is forwarded to the Examiner on July 09, 2004.

Therefore claims 1, 12 and 14 as amended by the preliminary amendment and claims 4-11, 13 and 15-18 as previously recited and presently newly added claims 64-69 are currently pending in the Application.

Claims 20-23, 25-28, 30-33, 35-38, 40-43, 46-49 and 56-63 are cancelled by the preliminary amendment.

Claims 19, 24, 29, 34, 44, 45 and 50-55 were previously cancelled.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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Claims 1, 2 4-11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1 line 4 recites, " a window being provided at a top surface of thin film" . The specification filed on 12/11/1997 page 24 cited by the Applicants' in support of the above recitation at lines 12-14 states " an introduction window is provided at the top of the projected portion 210" therefore the Application as originally filed does not support the recitation "a window being provided at a top surface of thin film"

Appropriate correction is required.

Claims 2,4-11 are rejected at least for depending upon rejected claim 1.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 recites the limitation " the wall" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claims 2,4-11 are rejected at least for depending upon rejected claim 1.

***Claim Rejections - 35 USC § 103***

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2,4-18, and 64-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cathey et al. (U.S. Patent No. 5,329,207 herein after Cathey) and Nakamura (U.S. Patent No. 5,200,630, herein after Nakamura) both previously applied for response to Applicants' arguments see section below.

With respect to claims 1,12, to the extent understood, in addition to the teachings previously stated, the presently recited steps:

Setting a substrate in a chamber ( Cathey col.4 lines 40-45,etc.) the substrate having a thin film having on a surface on of the substrate (Cathey fig. 3A # 8, col.5 lines 43-45, glass substrate – col. 1 lines 18-20).

Cathey does not specifically describe a portion of the wall of the chamber being projected in a direction apart from the substrate, a window being provided at a top of the surface of the thin film . ( Claim 1 ) and

A window being provided near a side wall of the chamber ( claim 12) .

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However Nakamura in figure 6 and col. 4 lines 37- 52, etc. describes a portion of the wall of the chamber being projected in a direction apart from the substrate, a window being provided at a top of the surface of the thin film to provide an enclosed space for the step of hydrogenating the grain boundaries to improve mobility of carriers.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include the a portion of the wall of the chamber being projected in a direction apart from the substrate, a window being provided at a top of the surface of the thin film taught by Nakamura in Cathey's method steps to provide an enclosed space for the step of hydrogenating the grain boundaries to improve mobility of carriers. (Nakamura col. 5 lines 28-35 and Cathey col. 6 lines 57-59).

Nakamura in fig. 6 and col. 4 lines 39-40 describes a window being provided near a side wall of the chamber ( claim 12) .

The remaining limitation of claims 1 and 12 are :

Applying energy through the window to a surface layer of the thin film (Nakamura figure 6, col. 4 lines 45-50) ( claim 1)

With a normal direction of the thin film shifted by an angle from a direction of an irradiation path ( claim 12 , Nakamura figure 6, col. 4 lines 55-65).

Melting at least the surface layer under a mixed gaseous atmosphere by the applied energy (See Cathey Fig. 3D col. 5 lines 63-65) and crystallizing at least the surface of the thin film. ( Cathey col.2 line46, etc.)

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Cathey in col. 4 line 25 describes the thin film to be a semiconductor film ( claim 2)

Cathey inherently discloses atmospheric conditions because it does not mention a specific atmospheric condition. ( claim 4).

Nakamura in col. 4 lines 54-68 discloses the use of an inert gas along with hydrogen ( Claim 5).

The recitation of claim 6 ( hydrogen halide), claims 7-8( Argon), is well known in the art.

The recitation of claims 9-11, Cathey discloses high-energy light beam laser source to melt (Cathey col. 6 lines 19-20).

The recitation of claim 12 ( gaseous atmosphere containing a component element ( see Cathey col. 6 lines 9-15).

However as shown above claim 12 is not allowable therefore claims 13-18 are also not allowable.

Claims 13 and 14 repeat the steps of claims 4 and 5 and is rejected for the same reasons.

Claim 15 the use of Silane is well known.

Claims 16-18 repeat the steps of claims 9-11 and are rejected for reasons stated above.

The presently newly added claims :



With respect to claim 64, Nakamura describes the method of forming a crystalline film according to Claim 1, wherein the mixed gaseous atmosphere contains a hydrogen-containing gas and an inert gas. ( Nakamura col.4 lines 54-68)

With respect to claim 65, Nakamura describes the method of forming a crystalline film according to Claim 12, wherein at least the surface layer of the thin film is melted and crystallized in a mixed gaseous atmosphere that contains an inert gas and hydrogen molecules. ( rejection of claim12 and Nakamura col.4 lines 54-68)

With respect to claim 66, Nakamura describes the method of forming a crystalline film according to Claim 12, wherein the mixed gaseous atmosphere contains an inert gas and a hydrogen halide. ( Nakamura col. 4 lines 64-68).

With respect to claims 67 and 68 , Nakamura describes the method of forming a crystalline film according to Claim 66, wherein the inert gas is a rare gas. ( Nakamura col. 4 line 68- XeCL laser is well known to include rare gas, including argon - see e.g USP 4,802,183).

With respect to claim 69, Nakamura describes the method of forming a crystalline film according to Claim 12, wherein a part of the energy enters the thin film, and another part of the energy is reflected from the thin film along a reflection path in the chamber, and course changing means changes a course of reflected energy to irradiate the thin film again with the reflected energy. ( Nakamura in fig. 6 nad col. 4 lines 50-53 teaches the gas flow (H) from the thin film i.e. the specular component of the reflected energy which goes straight back to the source, and a course changing means ( mirror 58, fig. 3

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of Nakamura that changes a course of reflected energy to irradiate the thin film again with reflected energy ).

*Response to Arguments*

Applicant's arguments filed 6/30/2004 have been fully considered but they are not persuasive for the following reasons :

Applicants' contention that Cathey and Nakamura do not disclose the steps of :

“ a method of forming a crystalline film, including setting a substrate in a chamber, the substrate having a thin film on a surface of the substrate, a window being provided, ( at the top surface of the thin film ) , applying energy through the window to a surface layer of the thin film ( not recited in claims 1-11, and therefore arguments not consummate in scope with the claims ) , melting at least the surface layer of the thin film under a mixed gaseous atmosphere by the applied energy, and crystallizing at least the surface layer of the thin film, is not persuasive for reasons set out under the rejection above where all these steps were shown to be obvious in view of the applied art.

Applicants' by attempting to point what individual references allegedly lack are engaging in impermissible piecemeal analysis.

Applicants' contention that there is no motivation to combine the teachings of Cathey, Nakamura and Sato based on incomplete analysis of what these references teach is not persuasive because all of the references are from the same field of endeavor namely Cathey deals with substrate and production of field emission devices, Nakamura deals with Thin film transistors used in image sensor or the like, and Sato

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deals with a semiconductor device having a single crystal layer ( also cited by applicants' in their IDS) .

The motivation to combine the references was previously stated in the Office actions and also stated above .


Therefore a prima facie case of obviouness has been established.

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Steven H. Rao whose telephone number is (571) 272-1718. The examiner can normally be reached on Monday- Friday from approximately 7:00 a.m. to 4:30 p.m.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956. The Group facsimile number is (703) 308-7724.

*SR*  
*2/21/08*

  
LONG PHAM  
PRIMARY EXAMINER